

# **Psychosocial intervention for children affected by war: The role of attachment and emotion regulation**

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**Kesäkuu 2015**

### **Abstract**

Development of emotion regulation (ER) is intertwined with attachment style. Attachment style and ER are related to mental health in general as well as to the severity of post traumatic stress disorder (PTSD) symptoms after traumatic experiences. Attachment style is also known to affect on outcomes of psychotherapy on adults, but research is lacking on children. An important part of cognitive behavioral therapy (CBT) is teaching affective modulation skills designed to improve ER. This study examined the role of attachment style and changes in attachment-related ER patterns in effectiveness of CBT-based psychosocial intervention (Teaching Recovery Techniques; TRT) in a war-context. Participants were 482 Palestinian children (10-13 years) who were randomized to either TRT or waiting-list groups. We assessed attachment dimensions, ER, PTSD symptoms, depressive symptoms, psychological distress, and psychological well-being. Data collection was done at the baseline (T1) and at the 9-month follow-up (T2). Results suggest that attachment style was differently associated with the change in mental health in the TRT and control groups. In the intervention group both secure and insecure-preoccupied attachment styles were associated with improved mental health, and children with avoidant attachment did not benefit from the intervention. In the control group avoidant attachment predicted negatively change in mental health, whereas secure and preoccupied attachment styles did not have effects on mental health. Changes in attachment related ER-patterns partially mediated intervention effects in the intervention group. The potential mechanisms underlying findings, and implications for clinical work and future research are discussed.

## **Psychosocial intervention for children affected by war: The role of attachment and emotion regulation**

Trauma-focused cognitive behavior therapy (CBT) is a recommended psychological intervention for children suffering with post-traumatic stress disorder (PTSD) (Bisson, 2007; National Institute for Clinical Excellence, NICE 2005), and also among different interventions designed specifically for children affected by war, CBT-based group-interventions are most widely studied and promising intervention types (Jordans, Tol, Komproe, & de Jong, 2009; Peltonen & Punamäki, 2010). Still there's not a solid explanation for how, why and through which mechanisms different psychological interventions produce therapeutic change (Kazdin, 2009), and not all interventions are equally helpful for all individuals (Norcross & Wampold, 2011). There is evidence about the beneficial role of secure attachment in contributing to positive intervention effects among adult trauma survivors (Forbes, Parslow, Fletcher, McHugh, & Creamer, 2010), but research is lacking concerning child survivors. Moreover, attachment style is closely related to development of emotion regulation (ER) (Calkins & Hill, 2007), and difficulties in ER are associated with PTSD severity (Ehring & Quack, 2010). Therefore this study examined the role of attachment and changes in ER in effectiveness of psychosocial intervention (TRT; Smith, Dyregrov, & Yule, 1999) on symptoms of PTSD and mental health more general among children affected by war.

### **Emotion regulation, attachment, and psychosocial well-being**

Emotion regulation refers to a set of processes people use to regulate their emotions. ER may dampen, intensify, or maintain emotion, depending on what is the individual's situational goal (Gross & Thompson, 2006). Effective and adaptive ER is a dynamic process, depending on situation, emotions and their intensity. Emotion dysregulation is therefore not simply lack of sufficient regulation, but rather regulation strategies operating in dysfunctional manner for the certain situation and environment.

It is a widely accepted view, that ER is learned in interaction with primary caregivers, and

that basis for effective ER is largely dependent on quality of the early attachment (Calkins & Hill, 2007). Contemporary theory about early attachment and its role in emotional functioning has its roots in the work of Bowlby (1988), who developed an evolutionary model about early attachment. According to Bowlby, during first years of life an infant constructs a cognitive representation about his/her experiences from interactions with the caregiver. This internal working model guides infant's expectations about his own emotional reactions and caregivers likelihood in managing them. Over the time infant internalizes these emotion modulation strategies, developing capacity for self-regulation. According to attachment theory, interactions with responsive and available attachment figures provides a secure attachment pattern, in which context infant can learn that it is acceptable and useful to express, explore and try to understand his feelings, resulting adaptive and flexible range of emotion regulation strategies. Infants who have experienced rejection and developed an avoidant insecure attachment pattern, learn to use excessively suppressive and self-reliant regulation strategies. If attachment figure has been irregularly available, infants experience high attachment anxiety, and develop ambivalent/preoccupied style to gain safety. They show heightened negative emotionality and excessive rely on attachment figure in regulating emotions (Cassidy, 1994). According to dynamic-maturational model of attachment by Crittenden (2006) children's early cognitive-emotional responses are meaningful in that they fit the unique care-provider styles and general safety vs. danger in developmental environments. They organize thus illuminate children's adaptive function within specific family context, and thus both secure and insecure styles denote developmental strengths rather than deficits.

Empirical research is augmenting about that dysfunctional ER is a risk factor for several psychopathologies. A meta-analytic review including 114 studies administered on adults, adolescents and children confirmed that dysfunctional regulation strategies (rumination, avoidance and suppression) are associated with more, and strategies considered more adaptive (acceptance, reappraisal, problem solving) with less overall psychopathology (Aldao, Nolen-Hoeksema, &

Schweizer 2010). A prospective study in a community setting (N=1065) found that dysfunctional ER on adolescence predicted later anxiety, aggressive behavior and eating pathology, and authors propose that deficits in ER is an important transdiagnostic factor that increases risk for a wide range of psychopathology outcomes in adolescence (McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema, 2011). Furthermore, in neuroimaging studies there has been found impaired functional connectivity in brain region network known to be involved in affect regulation in adults (Veer et al., 2010), and in adolescents with depression (Perlman et al., 2012). Recent study by Joorman, Cooney, Henry, and Gotlib (2012) found differences in the neural correlates of experience of negative affect and of automatic ER between adolescent girls with high or low risk for depression, suggesting that sustained amygdala activation and reduced cortical involvement when repairing negative affect may be trait markers of vulnerability to depression. Concurrently with a view of ER as an ample set of different skills and dynamic ability to flexibly use them functionally, it has been shown that among adolescents, a limited repertoire of regulation strategies is associated with more anxiety, social anxiety and depression symptoms than a profile with several different ER strategies (Lougheed & Hollenstein, 2012).

There's also a clear link between attachment insecurity and a wide range of psychopathology, and dysfunctional ER have been suggested as a mediating factor between them (for review, see Mikulincer & Shaver, 2012). However, only two studies demonstrating empirically, that the link between attachment insecurity and mental health problems among children and adolescents is partially mediated by deficits in ER could be found. Brumariu, Kerns and Seibert (2012) demonstrated that links between different attachment styles and anxiety are partially mediated through ER. In their study link between attachment security and anxiety symptoms was partially explained by poor emotional awareness, and link between attachment disorganization and anxiety symptoms was partially explained by catastrophizing and active coping. Brenning, Soenens, Braet and Bosmans (2012) showed in their study that attachment insecurity and depressive

symptoms were partially mediated through strategies of sadness regulation.

### **Traumatic experiences, attachment and emotion regulation**

Symptoms of the posttraumatic stress disorder (PTSD) include re-experiencing traumatic events, avoidance of reminding stimuli, increased arousal, and negative cognitions and mood (American Psychiatric Association, 2013). Many people experience traumatic stress symptoms shortly after traumatic events, but for a subgroup of people these symptoms persist (Bisson, 2007). Cognitive trauma theories implicitly consider, and use overlapping theoretical constructs with ER. According to Ehrlers's and Clarkes (2000) cognitive model of PTSD, important factors maintaining PTSD symptoms are dysfunctional cognitive and behavioral control strategies, e.g. thought suppression, rumination and avoidance.

There's a well-established empirical evidence that difficulties in ER and the severity of PTSD symptoms are indeed linked together (Ehring & Quack, 2010; Moore, Zoellner, & Mollenholt, 2008; Tull, Barret, McMillan, & Roemer, 2007). E. g. Ehring & Quack (2010) studied a large sample (N=616) of adults with diverse traumatic experiences, and found that dysfunctional emotion regulation were significantly associated with high levels of PTSD symptoms. These included lack of emotional clarity and awareness, emotional avoidance, suppression and unacceptance, difficulties in goal-directed behavior and impulse-control, and limited access to ER strategies. The use of reappraisal as an ER strategy was associated with less PTSD-symptoms. A study among war-affected adolescents in Uganda found a link between denial, rumination and blaming others as a cognitive ER strategy and severity of PTSD symptoms, and negative connection between putting to perspective and planning as cognitive ER strategies and PTSD symptoms (Amone-P'Olak, Garnefski, & Kraaij, 2007). Also, among children who have experienced a car-accident, a study by Ehrelrs, Mayou, and Bryant (2003) found connection between dysfunctional cognitive strategies, such as rumination and suppression of intrusive memories and PTSD-severity.

According a study by Benoit, Bouthillier, Moss, Rousseau, and Brunet (2010), the link

between attachment security and PTSD symptom severity after trauma in adulthood is mediated by ER strategies. They argue that this partly supports the theoretical model in which a lower level of attachment security would appear to be linked to dysfunctional ER strategies, which would affect regulation of trauma reaction and contribute to the development of chronic PTSD. Among children, Alink, Cicchetti, Kim, and Rogosch (2009) showed that maltreatment was related to dysfunctional ER only on children with insecure attachment style, and that was predictive of more internalizing and externalizing symptoms. They argue that maltreated children are at risk for developing emotion dysregulation and subsequent psychopathology, but this risk declines when children have a secure pattern of relatedness with their mother.

There is evidence that secure attachment can protect survivors from negative impacts of traumatic experiences. A study among former prisoners of war revealed that attachment style was stronger predictor of PTSD symptom intensity than trauma severity (Dieperlink, Leskela, Thuras, & Engdahl, 2001). Similar results have been obtained with child sexual abuse. Aspelmeier, Elliot, and Smith (2007) have reported that attachment security at least partially protects children who have been victims of child sexual abuse from later negative psychological outcomes of the abuse.

As a conclusion, there is empirical evidence demonstrating that attachment insecurity, dysfunctional ER, and more severe PTSD are connected. There however seems to be some theoretically different approaches to understanding the role of ER in link between attachment and mental health in trauma survivors. Rather clear-cut view would be understanding secure attachment style and resulting functional ER protecting, and insecure attachment style and resulting dysfunctional ER being a risk factor when encountering potentially traumatizing events. Miculincer and Shaver (2003) on the other hand have specified in their model, that security based ER strategies allow people to constructively and actively deal with negative affect, and freely experience and take advantage of the positive affect. Deactivating strategies, common to people with attachment avoidance distance people from their own emotions, whereas hyperactivating strategies common to

people with attachment anxiety seem to exacerbate negative affect and cause continued attention to real or imagined threats. Crittenden (1999, 2006) has emphasized the adaptive and self-protective function of also unsecure attachment behavior, and modeled developmental and maturational pathways of how attachment behavior can develop to psychopathology, implying that most likely associations between trauma experiences, attachment security, and ER are complex, cyclical and self-sustaining rather than linear. Mikulincer, Solomon, Shaver, and Ein-Dor (2014) have recorded reaction times for war-related words after subliminal neutral or secure priming and reported that former prisoners of war with persistent PTSD seemed to have disruption in the regulatory and healing functions of mental representations of attachment security. They suggest that severe PTSD is associated with reciprocal and recursive cycle, in where attachment insecurities prevent working through of the trauma, and resulting mental reactivation can strengthen negative representations of self and others, resulting more attachment insecurities.

The participants of this study are children living in life threat and dangers of war. Children living in war zones experience multiple traumatic experiences. War trauma involves chronic, repeatedly occurring fear and anxiety provoking experiences, which like stated above, often impact the development of ER and have more serious impact on child mental health. No studies have examined the effect of war on attachment directly, but there are theoretical grounds to expect attachment security to be affected. Bowlby (1973) hypothesized that life danger activates the security needs and attachment behavior. Later, Crittenden (2000, 2006) have emphasized that attachment behavior is self-protective and adaptive, and that in life-endangering environments adaptive behavior differs from adaptive behavior in secure environments. Moreover, war often produces traumatic experiences which directly effects on the attachment security of children, such as death of attachment figures, or family breakdowns via displacement of family members. Also it is known that all kinds of stressors can have adverse effects on parenting, and contribute to insecure attachment (Belsky & Fearon, 2002). Then again, war trauma differs greatly from e.g. child abuse



or maltreatment related traumas on the extent, that traumatic experiences are not produced by attachment figures, which is most clearly connected to most severe psychopathology and problems in attachment (Cicchetti, Rogosch, & Toth, 2006) and most severe problems in ER (e.g. Kulkarni, Pole, & Timko, 2013). It has been however suggested that parenting is adversely affected in the stress of war and that consequences of that mediate and moderate the initial effects of war on children (Belsky, 2008).

### **Psychosocial interventions, attachment and emotion regulation**

An important part of the trauma-focused CBT is teaching skills, involving affective modulation and cognitive processing skills designed for decreasing hyperarousal, identifying, expressing and modifying feelings, and recognizing connections between thoughts, emotions and behaviors (Cohen, Mannarino, Murray, & Igelman, 2006).

In treatment of anxiety disorders in children, it has been shown that CBT seems to provide increase in those regulation skills which are targeted in treatment (Suveg, Sood, Comer, & Kendall, 2009). Also there is evidence that emotion focused cognitive behavioral therapy increases ER skills in general, and alleviates anxiety in anxious children (Suveg, Kendall, Comer, & Robin, 2006). Some studies also evidence the link between beneficial therapy-related changes and brain functioning. A fMRI study on adults with depression demonstrated that brain activation in areas corresponding to emotion processing disturbances in depression appear to normalize following CBT, and that these changes are predictive of treatment response, possibly reflecting improvements in ER processes in response to CBT (Ritchey, Dolcos, Eddington, Strauman, & Cabeza, 2011).

In this study we analyzed the attachment-style related ER among children participating in the psychosocial intervention, called the Teaching Recovery Techniques (TRT, Smith et al., 1999). The TRT is a group-based psycho-social-educational 3-6 session program involving techniques aimed to help children to deal with the symptoms of intrusion, arousal and avoidance, and to adopt problem solving and group sharing approach to their difficulties. In line with the cognitive

behavioral treatment approach, it provides psycho-education about trauma and its consequences in a playful and experiential ways, trains effective coping skills, emotion recognition and regulation, and facilitates controlling and integrating overwhelming traumatic memories. There are results suggesting, that TRT is effective in decreasing PTSD symptoms in war-traumatized children (Ehnholt, Smith, & Yule, 2005; Barron, Abdallah, & Smith, 2012). Study based on the data of the present study showed that TRT was effective in alleviating symptoms of PTSD in Palestinian boys, but with girls only among those with low peritraumatic dissociation (Qouta, Palosaari, Diab, & Punamäki, 2012).

Based on the data of the present study, it has been shown that TRT intervention was not effective in changing ER patterns towards more functional, and ER did not mediate the intervention effects on children's mental health (Punamäki, Peltonen, Diab, & Qouta, 2014). Yet, there was a general decrease in the intensity of regulation of fear, anger and sadness, which in turn was associated with better mental health. In this study, we examined the role of attachment style in the efficaciousness of the TRT in promoting ER capacity and additionally, the role of attachment style and ER in the efficacy of the TRT in alleviating psychological symptoms on a group of Palestinian children affected by war. I.e. we examined changes in emotion regulation as a mediator and attachment style as a moderator in efficacy of TRT.

A number of authors have suggested, that interventions which promote emotion regulation capacity, might benefit people suffering from posttraumatic stress (e.g. Ford, Steinberg, & Zhang, 2011; Wolfson & Zlotnick, 2001), but few studies have directly examined mediating role of ER on CBT for PTSD. Hinton, Hofmann, Pollack, and Otto (2009) have examined a group of Cambodian refugees with PTSD and orthostatic panic attacks. Patients received CBT, and decline in PTSD symptoms was significantly mediated through improvements in orthostatic panic, and self-reported ability to distance from negative emotions. Also in one study with a group of adult patients with childhood abuse related PTSD, Cloitre, Stovall-McClough, Miranda, and Chemtob (2004)

have found that the strength of therapeutic alliance predicted improvements in PTSD symptoms, and that connection was mediated through improved ability to regulate negative mood states.

Attachment style has been somewhat under research within the context of adult individual psychotherapy. Levy, Ellison, Scott, and Bernecker (2011) have reported in their meta-analysis that generally attachment security is associated with more positive and attachment anxiety with more negative psychotherapy outcome, while attachment avoidance did not have effect on treatment outcome in their analysis. Not all researches have obtained similar results, and it has been proposed that clients with different attachment styles benefit more from different kinds of psychotherapy (see Daniel, 2006). It has indeed been reported that adults with high level on attachment avoidance did not respond as favorably to interpersonal psychotherapy, which emphasizes improvements in interpersonal relations, than to CBT, which emphasizes learning more functional strategies in relating to one's own cognitions and emotions (McBride, Atkinson, Quilty, & Bagby, 2006). In a context of group-based CBT for combat-veterans with PTSD, Forbes et al. (2010) have studied how adult attachment style predicts treatment outcome. They found that preoccupied attachment style predicted negative outcome for treatment, whereas for avoidantly or securely attached veterans treatment outcome was generally more positive. Another study by Stalker, Gebotys, and Harper (2005) investigated attachment as a predictor of treatment effects for 6-week inpatient program for traumatic stress on a group of women with histories of childhood abuse. They found that feared loss of the attachment figure predicted more negative treatment effects, suggesting that high levels of attachment insecurity may reduce woman's ability to respond to interventions helpful to other women in reducing PTSD symptoms. No studies have examined attachment style as a predictor of treatment effects on children, as well as no studies have addressed both attachment and emotion regulation within the framework of intervention for posttraumatic stress.

### **Research questions**

To conclude, we examine, first whether children's attachment style predicts the effectiveness

of the Teaching Recovery Techniques (TRT) in alleviating PTSD, psychological distress, and depression symptoms and increasing mental well-being. Second, we hypothesize that attachment style is associated with change in mental health through specific emotion regulation (ER) patterns, and test whether the mediating role of ER between attachment style and mental health change differs between the TRT and the control groups.

## Method

### Participants and procedure

The sample consists of 482 Palestinian girls (49.4 %) and boys (50.6 %) of 10-13 years ( $M = 11.29$ ,  $SD = 0.68$ ) from the Gaza Strip, randomized into a psychosocial intervention of TRT (Teaching Recovery Techniques) group ( $n = 242$ ) or into a control-waiting list group ( $n = 240$ ). They participated at baseline (T1) three months after the War on Gaza and before the intervention, and at and nine months (T2) follow-up. The share of gender and age was the same as in the whole group due the randomization.

School classes were chosen as the units of the cluster sampling procedure because they are naturally occurring children's groups. (1) two heavily bombed regions were selected in the Northern Gaza Strip, (2) two schools for girls and two schools for boys were then selected by simple random sampling from a list of schools in these areas, (3) fifth and sixth level school classes were selected from each school, and finally, (4) the students were randomly assigned to the intervention and control groups.

Information sheets were sent to students' parents explaining the purpose of the study, and verbal consent for the target child's participation was inquired. Three female and three male research assistants conducted the fieldwork in school classes and children received detailed verbal and written instructions before each questionnaire before filling-up them. The field work was supervised by the third author (SQ).

The planned eligible sample was 500, but 18 children were lost due to the differences in

estimated class sizes and absences from school. There were no refusals to participate, because the research was a part of routine school work, agreed with the ministry of education and school head masters. Between baseline (T1) and nine months follow-up (T2) 78 (16.2%) children were lost due to their absence or change of schools. Dropout was independent of child age, parents' education, refugee vs. citizen status and school, or children's exposure to traumatic war events. However, more boys (22.5%) dropped out than girls (9.2%),  $\chi^2(1,482) = 15.69, p < .001$ .

The data collection in four schools and eight classes was conducted by six research assistants and supervised by the third author (SQ). The research assistants read aloud the introductory letter to the children at the beginning of the assessment session as well as instructions and response alternatives for each questionnaire.

### **The intervention**

The TRT is a manualized intervention procedure with clear session procedures; the counsellors followed an Arab-language manual. The TRT involves evidence-based tools following the Cognitive Behavioral Therapy (CBT), and it aims at helping children to develop effective coping skills, empowerment and emotion regulation by narrative, imagery, body- and mind-related and psycho-educational techniques. All sessions started with warming up, introduction to the topic and reviewing of the home tasks. It was crucial to create a sense of safety and to provide meaningful tools to frame and control overwhelming emotions and painful experiences and losses, to recognize ones' own and others' stress reactions and to invite social helpers and abolish numbed feelings. The tools involved e.g., safe place method, relaxation, talking about and drawing frightening and disturbing experiences and dreams. Problem solving, storytelling, and role play techniques were also applied. Learning about emotions and bodily and verbal regulating of fear and horrific flashbacks were important part of the sessions. Further, children were trained to improve their sleeping patterns and to soothing their overwhelming emotions. Regulating breathing and somatic complains were introduced in relaxed and playful manners, teaching children to link their

bodily sensations with the traumatic experience, feelings and emotions. The intervention methods were aimed at enhancing children's symbolic, verbal and kinesthetic processing of traumatic experiences. The parents were informed and consented for the children's participation in the intervention. After each session, children were given homework involving other family members. The home tasks included e.g. practicing the screening method, talking about dreams and nightmares with parents, and drawing a happy ending to their dreams

## Measures

**Emotion regulation** was assessed by Emotion Regulation Questionnaire (ERQ) for Children (Rydell et al., 2007) that focuses on basic emotions (e.g., fear, anger, sadness) in the contexts that are relevant for the children (school, family, peer relations), involving self-regulation and regulation with the help of adults. We omitted the regulation of positive feelings (Exuberance) due to the results of a pilot testing and in order to save space. Children were presented 22 vignettes of each emotion and provided with alternatives how to regulate their emotions. Fear regulation (seven items) was assessed e.g., by "If I am scared by things I see or hear, I can think of something else to stop me from being scared", and anger regulation (eight items) e.g., by "If I am angry and my teacher tells me to calm down, I can control myself". Examples of sadness regulation (seven items) could be "When I am sad, I can think of something to stop me from staying sad" or "When I am sad, somebody can easily help me cheer up". Children responded on a 4-point Likert scale (*1 = Does not apply to me at all to 4 = Applies very well to me*). Three averaged sumvariables were constructed for each assessment points, the higher score values indicating intensive regulation of emotions of fear, sadness, and anger. The SEM (structural equation modelling) measure model is based on the changes in the ER scores between T1 (baseline) and T2 (nine-month follow-up), see Statistical analyses.

**Attachment style** was measured at T1 by the Coping Strategies Questionnaire, CSQ (Finnegan, Hodges, & Perry, 1996) and Security Scale (Kerns, Klepac, & Cole, 1996) that together

provide 28 everyday-situations separately to measure avoidant, preoccupied, and secure attachment. Children's responses reflect their mothers as attachment figure in helping, listening and caring for them in daily stressful situations. Their answers are depicted by the two stage methods. For example, *Avoidant attachment* is assessed by 10 every-day situations, such as "One day you come home from school and you are upset about something. Your mother asks you what the problem is". Two-stage forced-choices are provided: (1) Some kids would not want to talk to her about it or (2) Other kids would want to talk her about it. Under these two choices there are further two alternatives to choose (a) Sort of true for me or (b) Very true for me. *Preoccupied attachment* is also assessed by 10 every-day situations, such as "Your mother says she is thinking about going to visit a relative for a week or two". Two choices are (1) Some kids would be upset that she is going away for so long and would try to talk her out of going or (2) Other kids would not be upset and wouldn't try to talk her out of going. Again two further scoring of (a) Very true for me, (b) Sort of true for me (reverse coding). In measuring the *Felt security attachment*, children are instructed to answer the question 'how you feel about your mother' by giving them 8 two-stage choices, e.g., "Some kids worry that their mom might not be there when they need her" (but) "Other kids are sure their mom will be there when they need her". "Some kids feel that their mom does not help them enough with their problems" (but) "Other kids think that their mom helps them enough with their problems".

Three averaged sum variables were constructed, the higher score indicating more frequent behaviour/responses of felt security, avoidant, and preoccupied attachment styles.

**Posttraumatic Stress Symptoms (PTSS)** were evaluated by the 13-item Children's Revised Impact Event Scale (CRIES; Smith, Perrin, Dyregrov, & Yule, 2003). The scale covers the three core dimensions of re-experiencing (4 items), avoidance (4 items) and hyper-arousal (5 items) symptoms. Children indicated on a 4-point scale how often they had each symptom during the last

two weeks: 0 = *not at all*, 1 = *sometimes*, 2 = *often*, 3 = *very often*. Sum variables of total score of PTSS were constructed for T1 and T2, the higher score value indicating more symptoms.

**Depressive symptoms.** The Depression Self-Rating Scale for Children by (Birleson, Hudson, Grey-Buchanan, & Wolff, 1987) was applied. The 18-item self-report instrument assesses the cognitive, affective and behavioral dimensions of depression. Children estimated on a 3-point scale whether they had each symptom during the last two weeks: 0 = *not at all*, 1 = *sometimes*, 2 = *all the time*. Sum variables of all depressive symptoms were constructed for T1 and T2, the higher value indicating more depressive symptoms.

**Psychological distress.** The Strengths and Difficulties Scale (SDQ) by Goodman (1997) was applied to assess emotional, behavioral, and relational problems, hyperactivity, and prosocial behavior. Each dimension consists of five items, and children evaluated on a 3-point scale how well the description fitted them: 0 = *not at all*, 1 = *somewhat*, 2 = *yes, fits well*. A total sum variable was constructed for T1 and T2, and higher values of the scores indicated more psychological distress symptoms.

**Psychosocial wellbeing.** The Mental Health Continuum–Short Form (MHC–SF) for youth (Keyes et al., 2008) was applied. The 13 items assess the degree of well-being on the domains of emotional (positive affects), psychological (e.g. autonomy and self-acceptance) and social (e.g. social contribution and coherence). Children evaluated on a 5-point scale how often they had had the particular feeling or thought during the past month: 1 = *never*, 2 = *sometimes*, 3 = *often*, 4 = *every day*. A total sum variable was calculated for T1 and T2, the higher score value indicating more psychological wellbeing.

**Demographic variables.** Children reported the family SES, parental education and work situation, family's civic status, and family size.

### Statistical analyses

The TRT and control groups were compared for the demographics by  $\chi^2$  tests, and for



attachment, emotion regulation, and mental health variables by one-way ANOVAs. Correlations of the dependent and independent study variables were calculated as two-tailed Pearson coefficients. Structural Equation Models (SEM; AMOS 15.0 software; James L. Arbuckle. SPSS Framework Version) were applied to test the role of attachment style in predicting change in mental health and to model the mediating role of the change in emotion regulation (ER) between attachment and mental health change in the TRT intervention and control groups. The criterion for acceptable model fits were  $\chi^2$  values/df < 2.00, Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) above .90 and RMSEA below .06 (Browne & Cudeck, 1992).

To test mediation effect of emotion regulation, we followed three steps recommended by Baron and Kenny (1986) and MacKinnon, Lockwood, Hoffman, West, and Sheets (2002). First we tested whether attachment style (predictor) is associated with change in mental health (outcome). Second, we analysed the significance of the mediating effect by a joint model testing simultaneously both the association between predictor and change in ER (mediator) and the association between mediator and outcome. Third, to indicate mediation, we tested whether the strength of the association between predictor and outcome is significantly reduced when the mediation is included in the joint model (Freedman & Schatzkin, 1992). The testing of these SEM paths was run with a multigroup procedure comparing the significance of the estimated associations between the TRT and control groups.

The psychosocial intervention among war-affected children aimed at bringing changes in children ER and mental health. Therefore we used change scores as manifest variables in the SEM measurement models to indicate latent constructs of mental health and emotion regulation change. The change scores were formed by regressing the T1 values on T2 corresponding values, and saving them as residualized scores (Tabachnick & Fidel, 2001). Their scaling was modified so that a higher score indicates (a) improvement in mental health, and (b) decrease in ER.

The sample included 16 school classes, the average number of pupils being 32. The non-

independence of their responses can cause biases due to the reduced sample variation (Ukoununne, Gulliford, Chinn, Sterne, & Burney, 1999). The within-school classes biases were checked and corrected by (1) estimating the intraclass correlations (ICC) and their design effects (DEFFs) for attachment, ER, and mental health variables. (2) When the DEFF was  $> 2.00$ , 95% confidence intervals for regression coefficients were corrected for cluster effects, using the Kish correction (Musca et al., 2011). The correction consist of multiplication of the standard errors of regression weights by the design effect  $[1 + ICC_y * ICC_x * (n - 1)]^{0.5}$ , where  $ICC_y$  and  $ICC_x$  are intraclass correlation coefficients of the emotion regulation variables,  $y$ , and of the mental health variables,  $x$ , and  $n$  is the average number of children in a school class (Ukoununne, et al., 1999).

## Results

### Descriptive statistics

Due to the randomization, there were no differences in background variables between the intervention and control groups. A majority of the children (86%;  $n = 412$ ) lived in urban areas, 12% in refugee camps and 3% in villages. Father's education was evenly distributed across elementary (21%), secondary (28%), polytechnics (26%) and university (24%) levels, while of mothers only 8% had a university education and 40% had passed polytechnics. There was a high rate of unemployed fathers (49%), which corresponds with general Palestinian statistics in the Gaza strip during the international siege and economic blockade (UN:OCHA, 2009). Over 90% of mothers' worked at home, which is higher than in general epidemiological data from Gaza (UN:OCHA, 2009).

Table 1 shows ranges (T1), means and standard deviations of attachment styles, emotion regulation (ER), and mental health variables in the Intervention TRT and control groups. Results show no group differences either in attachment or ER, but PTSD symptoms were more common in the intervention ( $M=32.78 \pm 9.59$ ) than in the control group ( $M=27.78 \pm 10.63$ ) children ( $F(1,481) = 29.34, p < .0001$ ).

Table 2 shows the Pearson two-tailed correlations between attachment, ER and mental health variables in the Intervention (Below the diagonal) and Control (Above the diagonal) groups. The results revealed significant negative correlation between avoidant and preoccupied attachment styles (in the TRT group,  $r = -.48, p = .0001$  and in the Control group  $r = -.49, p = .0001$ ) and between secure and avoidant attachment styles (in the TRT group,  $r = -.34, p = .0001$  and in the Control group  $r = -.44, p = .0001$ ), but unexpectedly a positive correlations were found between secure and preoccupied children (in the TRT group,  $r = .27, p = .001$  and in the Control group  $r = .30, p = .001$ ). In both TRT and control groups, at T1 secure and preoccupied attachment styles had negative correlation with mental health symptoms, and positive with psychological wellbeing, while avoidant attachment correlated positively with symptoms and negatively with psychological wellbeing. However, in the control group at T2, avoidant attachment correlated positively with PTSD and psychological distress symptoms and negatively with psychosocial well-being. In the TRT intervention group, in turn avoidant attachment style correlated at T2 positively only with psychological distress, and negatively with PTSD and depressive symptoms. Concerning correlations between ER and mental health, some group differences emerged in both T1 and T2: In the TRT group, intensive ER correlated generally with lower levels of symptoms (except fear ER and PTSD), while in the control group, only intensive anger regulation correlated negatively with depressive symptoms in both times. Yet, interestingly, in the control group intensive regulation of both fear and anger correlated with higher psychological wellbeing at both T1 and T2, but in the TRT only intensive anger regulation with wellbeing at T2.

Insert Tables 1 and 2 about here

### **Attachment and change in mental health**

We analysed the attachment style associating with the mental health outcomes by comparing the coefficients in two-group SEM. Table 3 reveals that the direct model (Model 1) fits the data well in both TRT intervention and control groups (Fit indices  $> .90$ ,  $\chi^2$  values/df  $\leq 2.00$ ,

and RMSEA < .06). The results revealed that secure and insecure attachment styles were differently associated with the change in mental health in the TRT and control groups. In the intervention group both secure (BETA= .46, CR = 2.48,  $p < .01$ ) and insecure-preoccupied (BETA= .40, CR = 2.10,  $p < .05$ ) attachment styles were associated with higher levels of improved mental health, indicated by decrease in symptoms and increase in wellbeing. The children with avoidant attachment did not benefit from the TRT. Instead, in the control group improvement in mental health was lower among children with avoidant attachment (BETA= -.52, CR = -3.63,  $p < .0001$ ). Secure and preoccupied attachment style did not have any effects on symptoms or wellbeing in the control group.

Insert table 3 about here

### **Attachment predicting mental health change via emotion regulation**

The joint model (Model 2 in Table 3) including the change in emotion regulation (ER) as a latent mediator between attachment style and mental health fit the data well in both TRT and control groups (Fit indices > .90,  $\chi^2$  values/df < 2.00, and RMSEA  $\leq$  .06). Figures 1 and 2 illustrate the results of the joint mediating models among the TRT and control children. Testing the preconditions for ER mediation resulted in partial mediation and only in the TRT group, as the third precondition was fulfilled: The associations between all attachment styles and mental health were significantly reduced when the mediation ER was included in the model. The results of the differences in the standardized estimates of SEM models BETAs between the direct and mediator-including models (Freedman & Schatzkin, 1992) confirmed that reduction was significant in TRT group for secure ( $t(240) = 8.56$ ,  $p = .0001$ ), .avoidant ( $t(240) = -7.11$ ,  $p = .0001$ ), and preoccupied ( $t(240) = 7.61$ ,  $p = .0001$ ) attachment styles. Instead, in the control group the attachment style was associated with the emotion regulation, as children with avoidant attachment (BETA= .11, CR = 2.58,  $p < .01$ ) and children with secure attachment (BETA= .09, CR = 2.20,  $p < .05$ ) showed greater decrease in the ER intensity. Yet, this attachment-related ER change did neither associate with mental health, as indicated by insignificant BETA, and the reduction in the standardized estimates

(BETAs) between the direct model and mediator-including model were not significant in the control group.

Insert Figures 1 and 2 here

### **Discussion**

The aim of the study was to examine the role of attachment style and emotion regulation in predicting symptom attenuation following a psychosocial intervention among Palestinian children after a major war (2008/09). The results suggested that secure and insecure attachment styles were differently associated with the change in mental health in the TRT and control groups. In the intervention group both secure and insecure-preoccupied attachment styles were associated with higher levels of improved mental health, indicated by decrease in symptoms and increase in wellbeing. The children with avoidant attachment did not benefit from the TRT. In the control group improvement in mental health was lower among children with avoidant attachment. Secure and preoccupied attachment styles did not have any effects on symptoms or wellbeing in the control group. Results of this study concur with findings among adults with PTSD (Forbes et al., 2010; Stalker et al., 2005), showing that attachment style plays a role in intervention effects and mental health outcomes also on children.

Therapy research has generally confirmed that adult clients with secure attachment are most likely to gain benefit from psychotherapy (For review, see Levy et al., 2011). Research is mainly available on individual therapy on adults. Our results from the group-based intervention for children are in line with that, implicating that also children with secure attachment gain most clear benefit from a short group-based psychosocial intervention, here the TRT.

Our study focused on children and thus civilians as survivors of war. Different from general studies on adult individual psychotherapy (Levy et al., 2011) and from on adult combat-veterans with PTSD (e.g., Forbes et al., 2010) have reported that preoccupied attachment or high levels of attachment anxiety predict negative therapy outcomes, on this study preoccupied attachment also

predicted decreased symptoms of PTSD, depression, and general distress among children in intervention. It is thus possible that attachment style differently moderates intervention effects among adults and on children, and/or among civilians and soldiers. Allen and Miga (2010), for example have argued that attachment system changes significantly when moving from childhood to adolescence, moving from reliance to one or two attachment figures to a broader network of attachment relationships, and also towards managing emotions without direct reference to attachment figures. Thus, it could be possible that for children, group situation would not activate the attachment system as strongly as for older adolescents and adults, and that could explain why preoccupied attachment style did not prevent children from gaining benefit from the intervention.

It could also be possible that TRT includes some elements more suitable for participants with preoccupied attachment style than group-based CBT Forbes et al. (2010) used. These could be techniques providing more relaxed and secure atmosphere for children with preoccupied attachment, who generally are more prone to fear rejection, to participate more freely on intervention activities. On our study, groups also consisted of school classes, and children were already familiar with each other. This also could provide more secure atmosphere. Also it is possible that other, uncontrolled variables such as personal qualities of the counsellors have been affecting on intervention and providing more secure environment for children with preoccupied attachment style.

Generally individuals with preoccupied attachment undercontrol their emotions and rely on other-facilitated emotion regulation strategies and seek more intimacy, where as individuals with avoidant attachment are emotionally overcontrolled, rely excessively of self and often have difficulties in situations demanding emotional intimacy (e. g. Shorey & Snyder, 2006). It could be possible that those situational or intervention qualities which make this intervention more approachable and helpful for children with preoccupied attachment style, could be making situation more difficult or unpleasant for at least some of children with more avoidant attachment style. This

could be one explanation for that why intervention effects were not as clear and positive for children with avoidant attachment, than for children with secure or preoccupied attachment style.

It is not clear whether results concerning children with avoidant attachment implicate that most of them could not benefit from the intervention at all, or whether it implies that some of them gained improved and some deteriorated mental health. Generally empirically supported treatments are not helpful for everyone, and for some people in some circumstances, otherwise evidence based psychotherapies might be even harmful (Castonguay, Boswell, Constantino, Goldfried, & Hill, 2010). More specific future research is needed about avoidantly attached children, and their individual responses to this type of intervention in order to determine whether avoidant attachment prevents children from gaining improvements in mental health through it all together, or whether some of the avoidant children benefit and whether there is a subgroup of avoidant children, for whom intervention might impact negatively.

Results showed that changes in ER partially mediated association between attachment style and improvements in mental health in the TRT group, but not in the control group. This confirms our mediation hypothesis, that attachment style would be associated with intervention-induced improvements in mental health through specific attachment-related ER patterns. Earlier concerning the same data it has been shown that among TRT-group as a whole, ER did not mediate the intervention effects. (Punamäki et al., 2014). Current results however specify that the response to the TRT was different for children with different attachment styles, and that attachment style and the improvements in mental health were partially mediated through changes in ER.

There are some previous research implicating that the link between attachment insecurity and different psychopathologies is partially mediated by dysfunctional ER (Brenning et al., 2012; Brumariu et al., 2012), that CBT seems to provide increase in ER skills (Suveg et al., 2009), and that decline in PTSD symptoms as a response to individual CBT on adults is mediated through improvements in ability to regulate negative emotions (Cloitre et al., 2004; Hinton et al., 2009). Our

data is in line with the previous research, implicating that among children and adolescents, interventions that can help them to develop more functional ER, also would probably be helpful in alleviating psychological distress of war-trauma. Our results also concur with models and previous research implicating that ER strategies and their link to psychopathologies are attachment-specific (Brenning et al., 2012; Miculincer & Shaver, 2003), and that recognizing and understanding attachment strategies is important to providing helpful treatment (e. g. Crittenden, 2006).

In our results, attachment style seems to affect differently both for mental health outcome and for ER change in treatment group and in control group. In other words, attachment style seems to affect differently on mental health outcome and on ER change of children who are being helped to cope with their traumatic experiences, and of who are left to cope naturally without treatment. This might be implicating that participating in generally helpful intervention doesn't just facilitate natural coping and healing process, but it might bring some qualitative changes to it, which are difficult to predict on an individual level, and difficult to interpret from statistical analyses.

Results of this study implicate need for more detailed research about factors mediating and moderating effects of psychological interventions on individual, and on a group level. Results of this study show intervention to be effective for children with secure or preoccupied attachment style, and that changes in attachment-specific ER-patterns partially mediate intervention effects. For avoidant children, for whom intervention was not effective, future research is needed in order to understand whether limited improvement involves most of the avoidant children, or a subgroup of them. From the research on individual psychotherapy, we know that besides attachment style of the patients, also attachment style of the therapist, and the interaction of these has an impact on the outcome (Daniel, 2006). Less is known about the impact of the therapists own attachment style in group-based interventions such as TRT, as well as the effects of the attachment styles of the different group members, their similarity or dissimilarity, and their interactions with each other. In addition, more research information is needed about impact of the attachment style on



psychotherapy outcome on children and adolescents, and similarities and differences of it compared to adults.

Unexpectedly, in our results secure and preoccupied attachment dimensions measured at T1 correlated. Preoccupied and avoidant dimensions of the Coping Strategies Questionnaire (Finnegan et al., 1996) are assumed to represent attachment insecurity (see Yunger, Corby, & Perry, 2005), and other studies using same measures have not reported similar findings (e. g. Brumariu & Kerns, 2008; Schechtman & Dvir, 2006 ). It is hard to tell whether this represents a culturally or somehow other ways unique aspects of the data. Further research about attachment style and ER and their impact on intervention effects are warranted to tell whether our results are replicated also in different situations with different individuals.

This study has some limitations. All measures were self-report questionnaires, and some of the constructions studied such as ER or attachment are not entirely conscious and easily verbalized, especially for children. Behavioral data, or data from different sources (e. g. parents or teachers) would have given more comprehensive and perhaps more reliable data. Internal consistency of the responses on Emotion Regulation Questionnaire (ERQ) (Rydellet et al., 2007) which we used to measure ER was low, except for the total sum of ER intensity. Reliabilities were especially poor at the baseline (.54-.64), improving in the follow-up (.54-.78). Also, the context of our study is the aftermath of a major war characterized by excessive human and material losses and life threat, and the results may not apply for different kinds of traumatic situations, or other ways less intense war-like situations. Also the context of Islamic, Arabic Middle Eastern culture may have particular impacts, and the generalizability of the results to other cultural contexts may thus be poor. More research is needed about to what extent the role of attachment in mental health or emotions is culturally bound or universal.

Results of this study emphasize need for specific assessment of individual characteristics when addressing patients for interventions, and difficulty and multifacetedness of understanding

different factors affecting on treatment outcome on an individual level even when treatment itself is empirically based and generally helpful to majority of people. For future research this study emphasizes need for further shift from research of simple effectiveness of the interventions to more specific and detailed research of what variables affect on the effectiveness on the interventions, i. e. more specific research of different mediating and moderating variables of intervention effects.

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Table 1

*Descriptive statistics of Attachment Style Dimensions, Emotion Regulation (ER), and Mental Health in the Intervention (TRT: Teaching Recovery Techniques) and Control Groups<sup>a</sup> at Baseline (T1) and Nine-month Follow-up (T2): Ranges, Means and Standard Deviations*

	Intervention group (TRT)					Control group				
	Baseline T1			Nine-month Follow-up T2		Baseline T1			Nine-month Follow-up T2	
	Ranges T1	M	SD	M	SD	Ranges T1	M	SD	M	SD
Attachment dimensions <sup>b</sup>										
Secure	15 - 30	23.67	2.89			12 - 29	23.22	3.28		
Avoidant	12 - 36	18.95	3.81			12 - 31	18.93	3.52		
Preoccupied	17 - 37	28.97	3.79			17 - 37	28.76	4.09		
Emotion regulation <sup>c</sup>										
Fear	1 – 3.14	2.08	0.41	1.02	.46	1 - 3.14	1.16	0.40	1.00	0.39
Sadness	1 – 3.57	2.42	0.47	2.32	.59	1.29 - 3.71	1.44	0.48	1.31	0.56
Anger	1 – 3.38	2.31	0.43	1.24	.47	1 - 3.50	1.32	0.48	1.30	0.48
Mental health <sup>d</sup>										
Posttraumatic stress symptoms	6 – 65	32.78	9.59	24.28	9.82	1 - 65	27.79	10.63	25.83	9.24
Depressive symptoms	2 – 29	12.69	4.65	17.48	3.13	3 - 26	12.34	4.70	18.44	3.25
Psychological distress	25 - 56	41.68	5.28	40.95	5.44	24 - 52	41.68	5.33	40.47	5.14
Psychosocial well-being	19 -65	46.94	9.38	45.95	9.43	17 - 65	48.98	9.55	47.53	9.93

<sup>a</sup> The group sizes are TRT N = 242 at T1 and N = 207 at T2; Control N = 240 at T1 and N = 197 at T2; <sup>b</sup> The linear sumvariable indicate that a higher score refers to more each attachment quality; <sup>c</sup> The higher score indicates more intensive emotion regulation (ER) of each emotion; <sup>d</sup> Higher scores indicate more severe symptoms of posttraumatic stress, depressiveness, and psychological distress, and more psychosocial wellbeing.

Table 2

*Pearson correlations between study variables pre-intervention and nine-month follow-up for the intervention group (TRT, Teaching Recovery Techniques: below diagonal) and control group (above diagonal)<sup>a</sup>*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
<i>T1 Pre-intervention</i>																	
1. Secure attachment		-.44***	.30***	.06	-.07	.18**	-.09	-.33***	-.29***	.33***	.14*	-.01	.13*	-.05	-.01	-.25***	.24***
2. Avoidant attachment	-.34***		-.49***	-.04	.13*	-.09	.06	.29***	.28***	-.29***	-.14*	-.06	-.11	.12*	.07	.17**	-.27***
3. Preoccupied attachment	.27***	-.48***		.05	.01	.02	-.07	-.09	-.16*	.17**	.19**	.07	.10	.08	.01	-.14*	.19**
4. T1 Emotion regulation: Fear	.06	-.01	.06		.35***	-.31***	-.04	-.07	-.01	.14*	.11	.08	.20**	.08	-.10	-.10	.24**
5. T1 Emotion regulation: Sadness	.08	.08	.11*	.37***		.32***	.18**	.06	.16**	-.01	.14*	.33***	.24***	.11	.11	.09	.10
6. T1 Emotion regulation: Anger	.06	-.03	.08	.20**	.25***		-.04	-.21***	-.07	.15*	.22***	.24***	.29***	.07	-.07	-.14*	.30***
7. T1 PTSD-symptoms	-.04	-.10	-.07	.13*	.05	.01		.09	.30***	-.02	.07	.11	.02	.18**	.01	.25***	-.19**
8. T1 Depressive symptoms	-.17**	.14*	-.17**	-.16**	-.10	-.15*	.10		.52***	-.34***	-.16*	.01	-.22	.13*	.04	.36***	-.29***
9. T1 Distress (SDQ) symptoms	-.30***	.24***	-.18**	-.14*	.07	-.20**	.10	.32***		-.32***	-.14*	.13*	-.06	.11	.05	.41***	-.37***
10. T1 Psychological well-being <sup>b</sup>	.31***	-.23***	.27***	.02	.02	.04	.01	-.27***	-.20*		.19**	.12*	.18**	.08	.11	-.29***	.36***
<i>T2 Nine months follow-up</i>																	
11. T2 Emotion regulation: Fear	.01	.02	.08	.11	.17**	.02	-.08	-.09	-.06	.01		.32***	.43***	.24***	-.06	-.08	.27***
12. T2 Emotion regulation: Sadness	-.08	.06	.12*	.13*	.17**	.07	-.06	.01	.12*	.05	.51***		.46***	.26***	.09	.20**	.14*
13. T2 Emotion regulation: Anger	.08	.12*	.06	.20**	.04	.14*	-.06	-.03	-.08	.02	.28***	.44***		.07	-.01	-.12*	.32***
14. T2 PTSD-symptoms	-.12*	-.11*	-.05	-.15*	-.12*	-.05	.15*	.12*	.10	.01	-.05	.12*	-.01		.17**	.27**	.04
15. T2 Depressive symptoms	.03	-.11*	.05	-.02	.04	.17**	.12*	-.01	-.03	.04	-.09	.01	-.03	.15*		.10	.01
16. T2 Distress (SDQ) symptoms	-.22***	.18**	-.21***	-.06	.01	-.09	.02	.29***	.32***	.17*	-.05	.12*	-.23**	.16*	-.05		-.36***
17. T2 Psychological well-being	.09	-.09	.09	-.01	.03	.19**	-.03	-.17*	-.18**	.22**	-.01	.07	.19	.06	-.19**	-.43***	

**Note:** \* < .05; \*\* p < .01, \*\*\*p < .001 and .0001 (one tailed correlations) <sup>a</sup> TRT group T1 n = 242; T2 207, and Control group T1 n = 197; T2 n = 240

Table 3

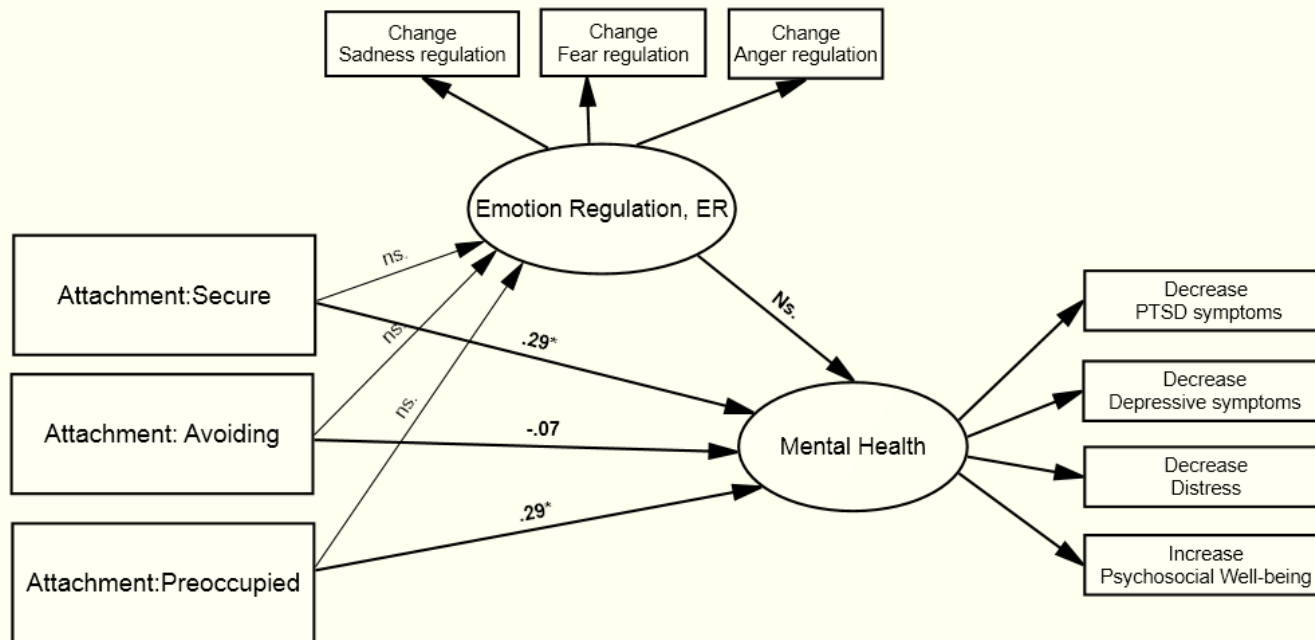
*SEM modelling on attachment, emotion regulation and mental health outcomes in the intervention and control groups: Model fit, parameter estimates (coefficients), and associations*

Model 1							
Attachment dimensions predicting mental health		TRT-Intervention group (N=242)			Control group (N=240)		
		Standardized estimate	S.E.	Critical Ratio	Standardized estimate	S.E.	Critical Ratio
Measure model for mental health							
Change in PTSD symptoms -> latent	Mental health	.32	.63	1.39	.21	.49	1.98*
Change in depress. symptoms -> latent	Mental health	.49	na	na	.51	na	na
Change in psychol. distress -> latent	Mental health	.29	.82	2.46**	.32	.24	2.67**
Change in well-being > latent	Mental health	-.33	.39	2.89*	-.10	.43	-.83
Structural models							
Secure attachment ->	Mental Health	.46	.10	2.48**	.17	.10	1.35
Avoidant attachment ->	Mental health	-.16	.07	-.87	-.52	.11	-3.63*****
Preoccupied attachment ->	Mental Health	.40	.08	2.10*	-.05	.08	-.41
Model fit indices		X <sup>2</sup> (7) = 9.93, p=.767; CMIN/DF =0.71 NFI = .98, CFI = 1.00 RMSEA = .0001			X2 (7) = 4.79, p=.685; CMIN/DF =0.68 NFI = .97, CFI = 1.00 RMSEA = .0001		

Model 2						
Emotion regulation (ER) mediating between attachment and mental health change	TRT-Intervention group (N=242)			Control group (N=240)		
	Standardized estimate	S.E.	Critical Ratio	Standardized estimate	S.E.	Critical Ratio
Measure model for change in mental health <sup>a</sup>						
Change in PTSD symptoms-> latent Mental health	.12	.57	.21	.20	.41	2.07*
Change in depress. symptoms-> latent Mental health	.42	.58	2.01*	.56	.42	2.62**
Change in psych. distress -> latent Mental health	.11	na	na	.27	na	na
Change in well-being -> latent Mental health	-.45	.88	-2.51**	-.17	.37	-1.59
Measure model for change in emotion regulation <sup>b</sup>						
Change in anger -> latent Emotion regulation	.62	.42	2.32*	.91	.57	2.80**
Change in fear -> latent Emotion regulation	.41	.79	1.77	.39	.23	.96
Change in sadness -> latent Emotion regulation	.38	na	na	.19	na	na
Structural models						
Secure attachment -> Mental Health	.29	.09	2.33*	.19	.10	1.55
Avoidant attachment -> Mental health	-.07	.07	-.60	-.46	.11	-3.36***
Preoccupied attachment -> Mental Health	.29	.08	2.20*	-.05	.08	-.41
Secure attachment -> Change in emotion regulation	.01	.01	.08	.09	.01	2.20*
Avoidant attachment -> Change in emotion regulation	.17	.01	1.38	.11	.01	2.58**
Preoccupied attachment -> Chan. emotion regulation	.04	.01	.47	.07	.01	1.74
Change in emotion regulation -> Mental health	-.15	.21	-.76	-.17	.04	-.41
Model fit indices						
	X2 (22) = 19.53, p=.61; CMIN/DF =1.11 NFI = .95, CFI = .99 RMSEA = .01			X2 (22) = 27.90, p=.179; CMIN/DF =1.27 NFI = .90, CFI = .97 RMSEA = .03		

Note: \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . \*\*\*\* $p < .0001$ . <sup>a</sup> The change refers to a residual score of regressing T1 mental health score on T2 corresponding score, the higher value indicating more improvement in mental health. <sup>b</sup> The change refers to a residual score of regressing T1 emotion regulation core on T2 corresponding score, the higher value indicating more intensive regulation of each emotion

**Figure 1. Structural Equation Modelling (SEM) of Emotion Regulating mediating between Attachment style and Mental Health: the Intervention based on the Teaching Recover Techniques (TRT)**





**Figure 2. Structural Equation Modelling (SEM) of Emotion Regulating mediating between Attachment style and Mental Health: the Control group**

